AMENDMENTS TO THE CLAIMS

Please amend the claims as follows:

1. (Currently Amended) A method for simulating ~~a multi-dimensional space,~~ trace impedance for application to manufacture a printed circuit board using a quasi-Monte Carlo model comprising:

generating a sequence of pseudo-random numbers according to a prescribed quasi-Monte Carlo model;

mapping each pseudo-random number R of the sequence of random numbers into multiple variables of unique values for the multi-dimensional space, the multi-dimensional space including D dimensions, where D is a number, the mapping providing a substantially even hard-coded point-cloud to define a grid of quasi-Monte Carlo points to provide some regularity in the point cloud over the multi-dimensional space; and

selecting a value of S according to a desired accuracy of a final simulation value, wherein the value of S defines a grid for use in conjunction with the mapping of the pseudo-random numbers into the multiple variables of the multi-dimensional space, wherein each of the multiple variables of the multi-dimensional space represents a corresponding D dimension value and wherein each dimension is characterized by a minimum and a maximum value, further wherein each dimension is characterized by a prescribed resolution S, and wherein S is the resolution of each dimension, and a ratio r, as defined by $r = s^D/P^N$ can be predetermined to be a prime number so that the value for S can be derived from the equation for r, whereby, the simulation value in the multi-dimensional space is reduced to provide an increased accuracy within a reduced time, the simulation value being applicable for simulations of trace impedance in circuit board manufacture.

2. (Cancelled).

3. (Cancelled).

4. (Cancelled).

5. (Cancelled).

6. (Cancelled).

7. (Previously Presented) The method of claim 1, wherein the D dimension values are further characterized by a first dimension D0 that includes minimum and maximum values defined as D0.min and D0.max, respectively, a second dimension D1 that includes minimum and maximum values defined as D1.min and D1.max, etceteras, up to a Dth dimension.

8. (Cancelled).

9. (Cancelled).

10. (Currently Amended) A method for simulating ~~a multi-dimensional space,~~ trace impedance for application to a printed circuit board design using a quasi-Monte Carlo model comprising:

generating a sequence of pseudo-random numbers according to a prescribed quasi-Monte Carlo model;

mapping each pseudo-random number R of the sequence of random numbers into multiple variables of unique values for the multi-dimensional space,

the multi-dimensional space including D dimensions, where D is a number, wherein each of the multiple variables of the multi-dimensional space represents a corresponding D dimension value and wherein each dimension is characterized by a minimum and a maximum value, the D dimension values further being characterized by a first dimension D0 that includes minimum and maximum values defined as D0.min and D0.max, respectively, a second dimension D1 that includes minimum and maximum values defined as D1.min and D1.max, etceteras, up to a Dth dimension, further wherein each dimension is characterized by a prescribed resolution S, the mapping providing a substantially even hard-coded point-cloud to define a grid of quasi-Monte Carlo points to provide some regularity in the point cloud over the multi-dimensional space; and

selecting a value of S according to a desired accuracy of a final simulation value, wherein the value of S defines a grid for use in conjunction with the mapping of the pseudo-random numbers into the multiple variables of the multi-dimensional space, wherein S is the resolution of each dimension and a ratio r, as defined by $r = s^D/P^N$, can be determined to be a prime number so that the value for S can be derived from the equation for r, whereby, the simulation value in the multi-dimensional space is reduced to provide an increased accuracy within a reduced time, the simulation value being applicable for simulations of trace impedance in circuit board design.

11. (Currently Amended) A method for simulating trace impedance ~~of~~ for application to a printed circuit board ~~characterized by at least three dimensions of a multi-dimensional space~~ design using a quasi-Monte Carlo model, said method comprising:

generating a sequence of pseudo-random numbers according to a prescribed quasi-Monte Carlo model;

mapping each pseudo-random number R of the sequence of random

numbers into multiple variables of unique values for the multi-dimensional space, the multi-dimensional space including D dimensions, where D is a number, the mapping providing a substantially even hard-coded point-cloud to define a grid of quasi-Monte Carlo points to provide some regularity in the point cloud over the multi-dimensional space; and

selecting a value of S according to a desired accuracy of a final simulation value, wherein the value of S defines a grid for use in conjunction with the mapping of the pseudo-random numbers into the multiple variables of the multi-dimensional space, wherein each of the multiple variables of the multi-dimensional space represents a corresponding D dimension value and wherein each dimension is characterized by a minimum and a maximum value, further wherein each dimension is characterized by a prescribed resolution S, and wherein S is the resolution of each dimension, and a ratio r, as defined by $r = s^D/P^N$ can be predetermined to be a prime number so that the value for S can be derived from the equation for r, whereby, the simulation value in the multi-dimensional space is reduced to provide an increased accuracy within a reduced time, the simulation value being applicable for simulations of trace impedance in circuit board design.

12. (Cancelled).

13. (Cancelled).

14. (Cancelled).

15. (Cancelled).

16. (Cancelled).

17. (Previously Presented) The method of claim 11, wherein the D dimension values are further characterized by a first dimension D0 that includes minimum and maximum values defined as D0.min and D0.max, respectively, a second dimension D1 that includes minimum and maximum values defined as D1.min and D1.max, etceteras, up to a Dth dimension.

18. (Cancelled).

19. (Cancelled).

20. (Currently Amended) Apparatus for simulating trace impedance ~~of~~ for application to a printed circuit board~~, the printed circuit board characterized by at least three dimensions of a multi-dimensional space~~ design using a quasi-Monte Carlo model, said apparatus comprising:

a random number generator for generating a sequence of pseudo-random numbers according to a prescribed quasi-Monte Carlo model;

a mapping processor for mapping each pseudo-random number R of the sequence of random numbers into multiple variables of unique values for the multi-dimensional space, the multi-dimensional space including D dimensions, where D is a number, wherein each of the multiple variables of the multi-dimensional space represents a corresponding D dimension value and wherein each dimension is characterized by a minimum and a maximum value, the D dimension values further being characterized by a first dimension D0 that includes minimum and maximum values defined as D0.min and D0.max, respectively, a second dimension D1 that includes minimum and maximum values defined as D1.min and D1.max, etceteras, up to a Dth dimension, further wherein each dimension is characterized by a prescribed resolution S, the

mapping providing a substantially even hard-coded point-cloud to define a grid of quasi-Monte Carlo points to provide some regularity in the point cloud over the multi-dimensional space; and

a value selector for selecting a value of S according to a desired accuracy of a final simulation value, wherein the value of S defines a grid for use in conjunction with the mapping of the pseudo-random numbers into the multiple variables of the multi-dimensional space, wherein S is the resolution of each dimension and a ratio r, as defined by $r = s^D/P^N$, can be determined to be a prime number so that the value for S can be derived from the equation for r, whereby, the simulation value in the multi-dimensional space is reduced to provide an increased accuracy within a reduced time, the simulation value being applicable for simulations of trace impedance in circuit board design.

21. (Currently Amended) A method of ~~manufacturing~~ designing a printed circuit board by simulating trace impedance using a quasi-Monte Carlo model comprising:

characterizing the printed circuit board by at least three dimensions of a multi-dimensional space; and

manufacturing the printed circuit board in accordance with a simulated trace impedance, the simulated trace impedance obtained by:

generating a sequence of pseudo-random numbers according to a prescribed quasi-Monte Carlo model;

mapping each pseudo-random number R of the sequence of random numbers into multiple variables of unique values for the multi-dimensional space, the multi-dimensional space including D dimensions, where D is a number, wherein each of the multiple variables of the multi-dimensional space represents a corresponding D dimension value and wherein each dimension is characterized by a minimum and a maximum value, the D dimension values further being

characterized by a first dimension D0 that includes minimum and maximum values defined as D0.min and D0.max, respectively, a second dimension D1 that includes minimum and maximum values defined as D1.min and D1.max, etceteras, up to a Dth dimension, further wherein each dimension is characterized by a prescribed resolution S, the mapping providing a substantially even hard-coded point-cloud to define a grid of quasi-Monte Carlo points to provide some regularity in the point cloud over the multi-dimensional space; and

selecting a value of S according to a desired accuracy of a final simulation value, wherein the value of S defines a grid for use in conjunction with the mapping of the pseudo-random numbers into the multiple variables of the multi-dimensional space, wherein S is the resolution of each dimension and a ratio r, as defined by $r = s^D/P^N$, can be determined to be a prime number so that the value for S can be derived from the equation for r, whereby, the simulation value in the multi-dimensional space is reduced to provide an increased accuracy within a reduced time, the simulation value being applicable for simulations of trace impedance in circuit board design.

22. (Currently Amended) A computer system~~,~~ including a printed circuit board designed by simulating trace impedance using a quasi-Monte Carlo model comprising:

~~a printed circuit board manufactured in accordance with a simulated trace impedance, said~~ the printed circuit board including impedance traces that characterize at least three dimensions of a multi-dimensional space of said printed circuit board , wherein said impedance traces include trace impedances obtained by:

generating a sequence of pseudo-random numbers according to a prescribed quasi-Monte Carlo model;

mapping each pseudo-random number R of the sequence of random

numbers into multiple variables of unique values for the multi-dimensional space, the multi-dimensional space including D dimensions, where D is a number, wherein each of the multiple variables of the multi-dimensional space represents a corresponding D dimension value and wherein each dimension is characterized by a minimum and a maximum value, the D dimension values further being characterized by a first dimension D0 that includes minimum and maximum values defined as D0.min and D0.max, respectively, a second dimension D1 that includes minimum and maximum values defined as D1.min and D1.max, etceteras, up to a Dth dimension, further wherein each dimension is characterized by a prescribed resolution S, the mapping providing a substantially even hard-coded point-cloud to define a grid of quasi-Monte Carlo points to provide some regularity in the point cloud over the multi-dimensional space; and

selecting a value of S according to a desired accuracy of a final simulation value, wherein the value of S defines a grid for use in conjunction with the mapping of the pseudo-random numbers into the multiple variables of the multi-dimensional space, wherein S is the resolution of each dimension and a ratio r, as defined by $r = s^D/P^N$, can be determined to be a prime number so that the value for S can be derived from the equation for r, whereby, the simulation value in the multi-dimensional space is reduced to provide an increased accuracy within a reduced time, the simulation value being applicable for simulations of trace impedance in circuit board design.